

AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning on line 9 on page 1 with the following paragraph:

The present application is related to U.S. Patent Application Serial No. 10/676,153, filed September 30, 2003 and titled "HIERARCHICAL SCHEDULING" (Attorney Docket No. ROC920030061), which is hereby incorporated by reference herein in its entirety.

Please replace the paragraph beginning on line 18 on page 9 with the following paragraph:

FIG. 5 illustrates a process according to the methods and apparatus of copending application serial No. 10/676,153 (Attorney Docket No. ROC920030061) of selecting from a main calendar a winning pipe that is empty.

Please replace the paragraph beginning on line 6 on page 10 with the following paragraph:

One method for distinguishing between the pipe flows included in a pipe and therefore, providing hierarchical scheduling of data (i.e., distinguishing between pipe flows included in a pipe, in addition to distinguishing between pipes and/or autonomous flows in a network processing system) has been addressed in commonly-assigned copending application serial No. 10/676,153 filed on even date herewith (Attorney Docket No. ROC920030061). According to the methods and apparatus of copending application serial No. 10/676,153 (Attorney Docket No. ROC920030061), a main or primary calendar is used to schedule autonomous flows and/or pipes to be serviced and a secondary calendar is used to schedule pipe flows to be serviced. Each autonomous flow, pipe, and/or pipe flow from which the network processor system 100 may receive data may be assigned a priority

and a bandwidth. The priority and bandwidth corresponding to the autonomous flow, pipe, and/or pipe flow determine the location in a calendar in which an entry for that autonomous flow, pipe and/or pipe flow is inserted and therefore, determine when the autonomous flow, pipe, and/or pipe flow is scheduled to be serviced.

Please replace the paragraph beginning on line 29 on page 10 with the following paragraph:

According to the methods and apparatus of copending application serial No. 10/676,153 (Attorney Docket No. ROC920030061), a pipe pipe flow may be selected to be serviced during a given time unit, and if no pipe flow included in that selected pipe needs to be serviced during that time unit, no pipe flow will be serviced during that time unit as shown in FIGS. 5-6 of the present invention. Consequently no data will be transmitted during that time unit

Please replace the paragraph beginning on line 15 on page 26 with the following paragraph:

As mentioned above when describing step 416, upon receiving notification of a winning pipe, the dequeue and reattach logic 312 determines whether the pipe queue that corresponds to the winning pipe is empty. According to the methods and apparatus of copending application serial No. 10/676,153 filed on even date herewith (Attorney Docket No. ROC920030061), if the pipe queue that corresponds to the winning pipe is empty (i.e., the pipe queue has no pipe flow entries that need to be serviced during the time unit), the dequeue and reattach logic 312 may give the pipe queue corresponding to the selected pipe a credit (e.g., by setting a pipe credit bit for that pipe queue in the pipe queue table 314). However, no pipe or flow is serviced during the time unit. If a pipe queue has a

credit, when a winning pipe flow entry is placed on that pipe queue in a subsequent time unit, the pipe queue table 314 notifies the dequeue and reattach logic 312 of this entry. The dequeue and reattach logic 312 will select the pipe flow entry from the pipe queue and will clear the pipe queue's win credit, as more fully described with reference to FIG. 5.

Please replace the paragraph beginning on line 3 on page 27 with the following paragraph:

FIG. 5 illustrates a process according to the methods and apparatus of copending application serial No. 10/676,153 (Attorney Docket No. ROC920030061) of selecting from a main calendar a winning pipe that is empty (i.e., the pipe queue corresponding to the winning pipe includes no flows to be serviced during the time unit). Although autonomous flows may be included in the primary calendar 308, in this example it is assumed that only pipes are included in the primary calendar 308 as the disadvantage of no data transmission during a given time unit is experienced only by pipes, and is not experienced by autonomous flows.

Please replace the paragraph beginning on line 12 on page 29 with the following paragraph:

In contrast to the methods and apparatus of copending application serial No. 10/676,153 (Attorney Docket No. ROC920030061) filed on even date herewith, the present invention provides a network processor with hierarchical scheduling that includes methods and apparatus for selecting multiple entries to be serviced during a time unit. The operation of the scheduler logic 300 is now described with reference to FIG. 7 which illustrates such a method. For the example of FIG. 7 it will no longer be assumed that all entries in the main calendar are unchained. Similarly, it will be assumed in the example of FIG.

7 that a first entry selected from the primary calendar is a pipe. This assumption is made because an autonomous flow will never be empty and thus is not helpful in understanding the advantage provided by the current invention.